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The
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A METHOD FOR TESTING THE SENSITIVITY OF VARIOUS SPECIES OF BACTERIA TO PENICILLIN, STREPTOMYCIN AND SULPHATHIAZOLE*

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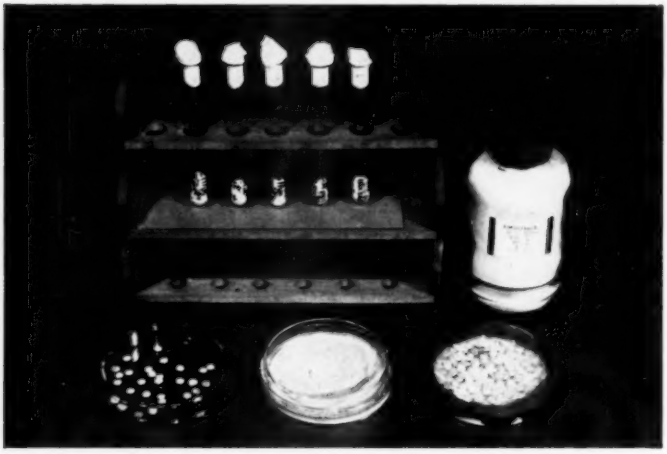
The methods commonly in use at present to determine whether an organism responsible for an infection is sensitive or resistant to such antibiotic substances as penicillin and streptomycin, and the sulphonamides are: (a) the "cup" method of Fleming (1) and Abraham, et al (2) in which the zone of inhibition on an agar plate around a cylinder of penicillin is used to determine sensitivity; (b) the "impregnated strip" method of testing the inhibiting power, and titrations by serial dilutions in nutrient broth (3); (c) the dilution test of Foster and Woodruff (4) in which readings are made in a nephelometer; (d) tests carried out in blood (5), using hemolysis as the indicator of growth, and various others.

Each of the above methods has certain disadvantages in laboratories where tests are carried out only occasionally. Several workers, Epstein, et al (6) Lamanna and Shapiro (7), Heatley (8), and Vincent and Vincent (9) have used blotting paper discs impregnated with various substances to detect bacterial sensitivity and for the assay of solutions. In such methods the discs are laid wet on the surface of an inoculated agar plate or are impregnated while lying on the agar by dropping the solutions on to them.

* Third Award, A.S.M.T., read before Convention, San Francisco, June, 1946

Flosdorf and Mudd (10) have demonstrated the use of anhydrous calcium sulphate as an efficient desiccant. The method described by Morley (11) in which sterile blotting paper discs are impregnated with penicillin, dried in a calcium sulphate dessicator and stored, was found to be convenient because this makes it unnecessary to maintain suitable dilutions of penicillin and streptomycin, which because of their instability must be frequently renewed. This method proved to be simple, economical, and amendable to modifications suitable for testing for sensitivity of various species of bacteria in the routine laboratory and also for teaching purposes.



1. Five mm. diameter blotting paper discs impregnated with penicillin.
2. Cover of petri dish half filled with plaster of Paris—cobalt blue mixture.
3. Sterile petri dish containing plaster of Paris-cobalt blue mixture, and dried discs. The dish is rimmed with plasticine.
4. Five mm. diameter impregnated discs ready to be placed in storage bottle.
5. Storage bottle rimmed with plasticine.

METHOD

Preparation of Desiccant

For the preparation of the desiccator plates the following was prepared: 215 grams of calcium sulphate was mixed with 125 cc. of warm water (40°C.) containing 30 grams of cobaltous chloride crystals ($CoCl_26H_20$) (C. P. Baker). The cobaltous chloride acts

as an indicator, which is blue when dry but pink in the presence of moisture. When the mixture was of a heavy cream consistency, the cover of a petri dish was half filled with the mixture and allowed to set at room temperature overnight. This amount half filled the covers of six petri dishes. These were heated in the hot air oven at 180°C. for one hour. The bottom of the petri dish was rested against the cover; when the oven was turned off, the bottom was lowered on to the dish by means of forceps.

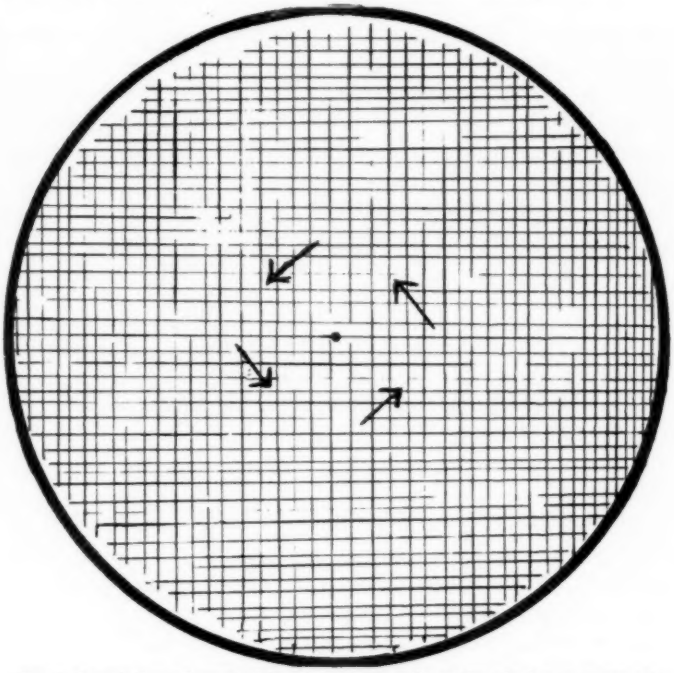


Fig. 1. Inoculation of agar plates from broth cultures by placing a measured amount from a 5 mm. loop in the center of the plate and streaking in four sections.

Desiccator storage bottles for the finished discs were made by filling 500 cc. capacity discarded blood bank bottles one-third full with the calcium sulphate-cobalt chloride mixture, and then rotating on a level surface until the plaster was set in a layer on the wall. The bottles were allowed to dry at room temperature

overnight, then heated at 180° C. for one hour. Metal screw tops were sterilized separately and fitted onto the bottles in the oven when cool enough to handle, and then sealed against moisture by rimming the covers with plasticine. After use the seal can be quickly restored by running the finger around it. These storage bottles have remained blue after four months' storage in the refrigerator freezing unit.

Preparation of Discs

Discs 5 mm. in diameter were cut, using a paper punch, from commercial white blotting paper. Approximately 100 discs were placed in each of five petri dishes and sterilized in the autoclave for one-half hour at 121° C. The discs were cooled in the refrigerator and impregnated with a cold solution of the desired stock solutions.

Preparation of stock dilutions of penicillin, and impregnation and drying of discs

Ten cc. of sterile physiological saline was added to 100,000 units (manufacturer's assay) dried penicillin (sodium) powder (Squibb). From this solution which contained 10,000 units per cc. stock solutions were prepared by the following table:

2.25 cc. sterile broth*/0.25 cc. 10,000 u/cc.=1000 u/cc.
2.25 cc. sterile broth*/0.25 cc. 1,000 u/cc.= 100 u/cc.
2.25 cc. sterile broth*/0.25 cc. 100 u/cc.= 10 u/cc.
2.25 cc. sterile broth*/0.25 cc. 10 u/cc.= 1 u/cc.
2.25 cc. sterile broth*/0.25 cc. 1 u/cc.= 0.1 u/cc.

These dilutions were added to the petri dishes containing the one hundred 5 mm. diameter sterile blotting paper discs. This amount impregnated each disc, leaving only a very small amount of excess solution. If more than 0.2 cc. of excess solution was present it was pipetted off. Before storage the discs were tested for sensitivity, and the results recorded in Table 1.

The covers of the petri dishes containing the impregnated discs with the penicillin dilutions were replaced with the petri dish covers containing the sterile calcium-sulphate cobalt-chloride

* Tryptose (Bacto) ..... 2 per cent.
NaCl (C.P.) ..... 0.5 per cent.
Distilled water pH 7.2

Storage of dried discs

mixture. These were rimmed with plasticine and placed in the refrigerator freezing unit for 48 to 72 hours to dry.

When the discs were dry they were placed in sterile tubes (diameter approximately 1.5 cm. x 12 cm. long) with cotton stoppers by means of sterile forceps. These were labelled, placed in the sterile storage bottles, the bottles rimmed with plasticine and kept in the refrigerator freezing unit ready for use.

When the discs were to be used they were removed from these tubes and placed in small (5 cm. diameter) sterile petri dishes and moistened with sterile distilled water so that no excess moisture was present. If too moist the disc was drained against the edge of the dish before placing on the inoculated plate.

Preparation and inoculation of agar plates

Early in the course of these experiments it was noted that the depth of the agar in the plates had a marked effect on the size of the zone of inhibition. With agar plates from 8 to 10 mm. thickness the zones were less clear and of smaller width, while plates of approximately 4 mm. thickness gave the maximum clarity and size of zone of inhibition. Thinner layers of agar tended to crack and dry up although the zones of inhibition were often larger. For subsequent tests plates of approximately 4 mm. depth of agar were adopted.

A stock strain of Staphylococcus aureus (No. 44) and of Streptococcus hemolyticus (No. 1) were selected as suitable test organisms, mainly for two reasons, first, because they were very sensitive to the action of penicillin, and, second, because when a series of tests is to be made it is well to use the same strains as controls.

For penicillin tests the organisms were grown in one per cent rabbit serum broth for 24 hours at 37° C.*. Five per cent rabbit blood agar plates were inoculated from this broth by placing a measured amount, using a 5 mm. diameter inoculating loop, in the center of the plate and streaking in four sections, covering

* Or with certain organisms whose growth on solid agar was preferred, the growth was suspended in sterile broth and standardized to between No. 6 and No. 7 MacFarlane standards (1 billion 800 million organisms per cc.)

the entire surface (see Fig. 1). This amount was just sufficient to cover the plate without making it excessively wet.

Each plate was marked with a wax pencil so as to accommodate five discs of the different penicillin dilutions. The prepared discs were carefully placed onto their proper place by use of a flamed and cooled forceps, and incubated. They were examined at 24 hours, and the diameter of the zone measured. This measurement included the paper disc.

Fig. 2. Twenty-four hour blood agar plate culture of Staphylococcus aureus No. 44. Zones of inhibition of growth around blotting paper discs impregnated with 0.1, 1, 10, 100 and 1000 units of penicillin which had been dried and stored for 12 weeks.

Results

In Table 1 the bacterial species are arranged in groups in the order of the age of the dried discs used for that particular group. It will be noted that certain species such as the pneumococci,

Streptococcus viridans and Streptococcus hemolyticus show rather marked strain differences. Maclean, et al (12) have recorded a similar variability in sensitiveness to sulphapyridine of individual strains of the pneumococcal types.

TABLE 1.

Sensitivity of various bacterial species tested with dried penicillin discs.

Bacterial species	Age of dried discs	Units of penicillin/cc				
		0.1	1	10	100	1000
Staph. aureus No. 44	Before storage	0**	10	15	20	25
Strep. hemolyticus No. 1		7	12	18	25	35
Strep. pneumoniae, Type I No. 1		0	10	17	25	30
Strep. pneumoniae, Type II No. 1		5	20	complete inhibi-		
Strep. pneumoniae, Type III No. 1		6	20	tion in this area.		
Straph. aureus No. 44	Five weeks	0	7	15	18	25
Streph. hemolyticus No. 1		8	12	20	25	33
Neisseria gonorrheae No. 1		5	10	15	18	23
N. meningitidis, Type I, No. 1		0	0	7	18	21
N. catarrhalis No. 1		0	0	0	12	18
Hemophilus influenzae, Type B		0	0	20	25	30
Corynebacterium diptheriae No. 40, (intermedius type)		0	0	10	20	24
C. diptheriae, (mitis type)		0	0	8	17	20
C. diptheriae, (gravis type)		0	6	15	25	32
Staph. aureus No. 44	Twelve weeks	0	8	21	25	30
Strep. hemolyticus No. 1		15	18	30	33	38
Strep. pneumoniae, Type II, No. 2		0	10	20	30	36
Strep. viridans (mitis type)		0	0	20	25	30
Strep. viridans (mitis) No. 38		0	0	18	22	28
Strep. viridans (mitis) No. 07328		0	6	25	36	45
Strep. lactis		0	6	15	25	30
Strep. hemolyticus No. 3		20	30	35	complete	
Corynebacterium diptheriae No. 2		0	0	7	10	20
Hemophilus influenzae		0	0	5	8	15
Clostridium septicum*		0	0	0	0	0
Cl. botulinum, Type A*		7	9	12	15	18
Cl. welchii No. 3*		6	8	12	18	30
Cl. tetani No. 2*		Complete inhibition of growth except around edge of plate.				

*48 hour growth in anaerobic jar.

**The figures indicate the diameter of the inhibitory zone in mm.

Streptomycin

The same procedure as for penicillin was followed with the exceptions noted.

Preparation of stock dilutions of streptomycin

0.05 gram of streptomycin (sulphate) (Pfizer) (one million units per gram*—manufacturer's assay) was weighed aseptically. Five cc. of sterile broth was added to the dried powder, and the stock dilutions prepared as follows:

The above dilution contains 10,000 u/cc.

(2 cc. of this was used to impregnate 100 discs.)
2.25 cc. sterile broth/0.25 cc. 10,000 u/cc.=1000 u/cc.
2.25 cc. sterile broth/0.25 cc. 1,000 u/cc.= 100 u/cc.
2.25 cc. sterile broth/0.25 cc. 100 u/cc.= 10 u/cc.
2.25 cc. sterile broth/0.25 cc. 10 u/cc.= 1 u/cc.

E. coli and Salmonella typhi were used as control organisms.

The results with streptomycin for various bacterial species are covered in Table 2. There appeared to be no loss of potency of discs which had been stored for three months.

Sulphathiazole

The same procedure as for penicillin was followed with the exceptions noted.

Preparation of stock dilutions of sulphathiazole

Five different concentrations of sulphathiazole were used for impregnating the discs, as follows: 10, 25, 50, 100 and 150 milligrams per cent. The dry powder was dissolved in sterile broth because of its greater solubility. The discs were dried in the same manner as described for penicillin.

Table 3 gives the results of this experiment. The organisms tested were grown on blood agar plates and incubated for twenty-four hours. It will be noted that the strain of Corynebacterium

* One unit of streptomycin was originally defined as that quantity which will inhibit a given strain of E. coli in 1 cc. of nutrient broth or agar. (13) The potency of a streptomycin concentrate is now expressed in terms of its equivalent in weight of pure streptomycin base, 1 microgram of the latter being equal to one unit in the former nomenclature. (14)

diphtheriae used appeared to be the most sensitive, and was therefore used as the test organism.

TABLE 2.

Sensitivity of various bacterial species tested with dried streptomycin discs.

Bacterial species	Age of dried discs	Units of streptomycin/cc.				
		1	10	100	1000	10000
E. coli No. 107	Before storage	5*	6	7	15	25
Salmonella typhi No. 1		0	6	8	18	28
Salmonella paratyphi B		6	7	10	20	25
Brucella abortus		0	6	14	34	40
E. coli No. 107	Two months	5	6	7	20	30
Salmonella typhi No. 1		5	6	10	20	26
Salmonella paratyphi B		5	6	12	23	28
Salmonella cholera-suis		0	6	7	10	20
Salmonella give		0	5	8	12	22
Salmonella enteritidis		0	6	10	13	23
Salmonella panama		0	8	10	12	22
Salmonella newport		0	6	15	18	26
Salmonella typhi-murium		6	7	7	18	24
Pseudomonas pyocyanea		0	6	6	8	22
Klebsiella pneumoniae, Type A		0	0	7	14	15
Alkaligenes fecalis		7	8	10	10	12
Proteus vulgaris No. 1		6	6	13	20	28
Proteus OXK		0	6	6	10	11
E. coli No. 107	Three months	6	6	10	15	24
Salmonella typhi No. 1		6	6	15	20	30
Brucella abortus		6	6	15	35	42
Klebsiella pneumoniae		6	6	10	20	30
Aerobacter aerogenes		5	7	7	14	28
Salmonella typhi No. 06615		0	5	7	20	32
E. coli No. 07325		6	6	10	15	20
E. coli No. 07410		6	6	9	20	25
Proteus vulgaris No. 07410		6	6	13	20	28
Shigella sonnei		7	8	8	20	25
Shigella alkalescens		5	6	7	15	20
Shigella paradysenteriae		5	5	6	12	18
Hemophilus influenzae, Type B, No. 1		0	20	Complete inhibition in this area.		
Hemophilus influenzae No. 2		0	0	6	17	25
Corynebacterium diptheriae No. 40		0	0	7	20	27
Neisseria catarrhalis		0	0	10	13	15
Enterococcus fecalis		0	0	0	6	10
Streptococcus lactis		0	0	0	0	15

*The figures indicate the diameter of the inhibitory zone in mm.

TABLE 3.

Sensitivity of various bacterial species tested with dried sulphathiazole discs.

Bacterial species	Age of dried discs	Milligrams per cent of sulphathiazole				
		10	25	50	100	150
Corynebacterium diptheriae No. 40	Before storage	7*	17	18	19	22
Neisseria catarrhalis		0	0	10	12	12
Strep. hemolyticus No. 1		0	0	0	5	7
Staph. aureus No. 40		0	0	0	5	6
Corynebacterium diptheriae No. 40	Two months	8	15	20	21	25
Strep. hemolyticus No. 1		0	0	6	6	10
Staph. aureus No. 44		0	0	6	6	8
Strep. pneumoniae, Type II		0	0	5	6	7
Strep. pneumoniae, Type III		0	0	0	0	0
Strep. viridans No. 07328		10	20	30	30	35
Strep. lactis		0	0	0	0	0

*The figures indicate the diameter of the inhibitory zone in mm.

Summary

Practical details of a method of testing the sensitivity of various bacterial species to penicillin by impregnating blotting paper discs, drying them in a calcium sulphate desiccator and storing, is described.

The method proved to be of value since it makes it unnecessary to prepare and store solutions of penicillin.

A similar method is described to detect sensitivity to streptomycin and sulphathiazole.

Acknowledgment of appreciation is made to Mr. Glenn Mills, Department of Photography, University of Colorado School of Medicine and Hospitals, for preparing the photographs.

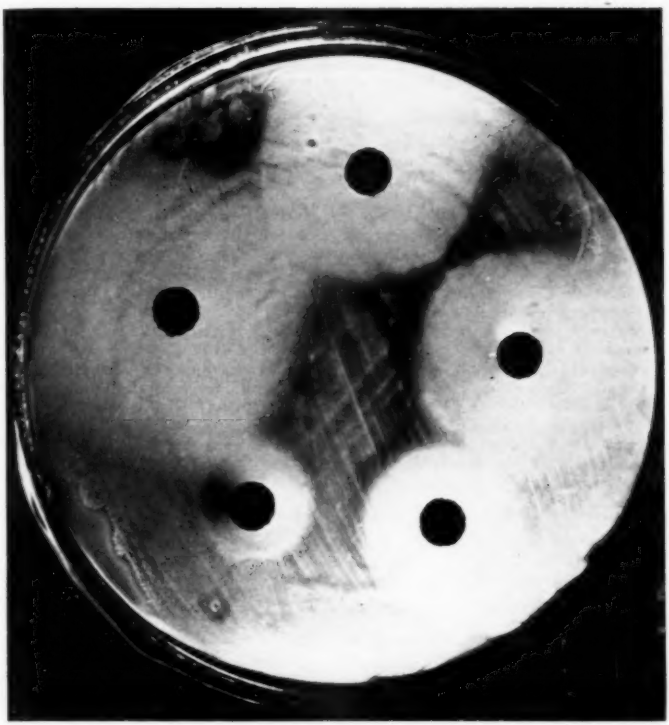


Fig. 3. Twenty-four hour blood agar plate culture of Streptococcus hemolyticus No. 1. Zones of inhibition of growth around blotting paper discs impregnated with 0.1, 1, 10, 100 and 1000 units of penicillin which had been dried and stored for 12 weeks.

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A SIMPLE METHOD FOR THE COMPLETE ABSORPTION OF NATIVE SHEEP AMBOCEPTOR IN WASSERMANN SERUMS*

By ELEANOR A. STACKHOUS, M.T., SEROLOGIST

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The accuracy of the Wassermann test depends in a large measure on the adjustment of the hemolytic system in which the quantitative relationship between ambocepter and complement is of paramount importance. This relationship, however, is not governed by laws of simple chemical reactions. Already at the turn of the century Morgenroth (1) pointed out that only a minimum amount of complement was necessary if large amounts of amboceptor were employed in order to hemolyze a fixed amount of homologous cells.

Unfortunately a most careful titration of complement and/or amboceptor in the hemolytic system does not solve the problem, as 60-80% of human sera contain native sheep amboceptor varying in amounts from a fraction to several units per 0.1 cc. (Eagle, Gradwohl, Von Saun (2), place the percentage of serums containing native amboceptor at 51-95%). Many attempts have been made to eliminate this source of error. Baurer suggested that the native sheep ambocepter be estimated in each specimen and that sera containing more than 1 unit per 0.1 cc. should not receive any amboceptor after fixation. Noguchi (3) introduced the human hemolytic system for the same reason. In other methods the use of smaller amounts of serum were supposed to reduce this source of error. The most widely employed method for the control of the native sheep amboceptor is its absorption by washed sheep cells.

* First Award—Pennsylvania Society of Medical Technologists and Laboratory Technichians paper-writing contest, 1945-'46.

I have been particularly interested in the latter method, using the technique advocated by Kolmer (4), but it has not been entirely satisfactory for two important reasons:

1. The serums showed much more hemolysis after centrifuging and often gave anticomplementary or foggy readings. The clear sparkling hemolysis obtained without the absorption procedure was often lost.

2. This method was not adequate to absorb all of the native amboceptor. Some would be absorbed, but when there was a large quantity present, there would still remain an adequate amount to give complete hemolysis of the sheep cells without the addition of more amboceptor. Since the reason for controlling the amount of amboceptor is to assure a maximum sensitivity of the reaction, incomplete absorption does not eliminate this source of error.

At Dr. Eiman's suggestion that reactions were speeded up at room temperature and slowed in the icebox and also that if sheep cells were added to raw serum containing both complement and native sheep amboceptor, you were bound to have hemolysis, I have devised the following technique, and have found it satisfactory in overcoming the above mentioned difficulties. It follows the suggestions of Eagle 1937. (5)

Procedure: 1. Arrange and label blood specimens. Release clots and pour over serum into 100 x 13 mm. tubes labeled to correspond to blood specimens.

2. Centrifuge these tubes to obtain clear serum with the cells packed in the bottom of the tube. Do not transfer supernatant serum to another tube.

3. Heat serum at 56° C. for 30 minutes if flocculation tests are also to be done.

4. Allow serums to cool to room temperature 5-10 minutes. Then add 1 drop of freshly washed sheep cell sediment to each tube. Be sure to mix intimately, the cells with the serum, so that all the serum is clouded by the sheep cells. Do not allow the cells just to fall through the serum as this will not give adequate absorption. Allow to stand at room temperature for 30 minutes.

5. Centrifuge until the supernatant serum is clear, then pour serum into clean, labeled tubes. Proceed with either the Complement fixation or Flocculation tests.

Conclusion: 1. 30-60% of patient's sera contain enough native amboceptor to give sparkling hemolysis without the addition of any antisheep hemolysin.

2. Adding sheep cells for absorption before heating the sera and letting stand at icebox temperature is not adequate to absorb all native sheep ambocepter from all sera. By this method many sera showed hemolysis, were muddy in appearance and made reading of Kahns difficult. Also, many anticomplementary readings were encountered.

3. By using the above described method, all native sheep amboceptor is absorbed from all sera.

4. No hemolysis occurs because the complement is inactivated before the addition of the sheep cells.

5. The presence of the patient's cells packed in the bottom of the tubes does not cause any difficulty in the inactivation. This saves an extra step, more tubes, more work and time. The only extra step involved is two centrifugings.

6. At least 1,900 sera have been treated this way and all the native sheep amboceptor has been completely absorbed leaving the sera clear and without hemolyzed red cells.

I wish to extend my appreciation and thanks to Dr. John Eiman, my director, for his suggestions and advice.

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THE MORPHOLOGY OF CELLS OF THE PERIPHERAL BLOOD DURING RECOVERY IN A CASE OF GRANULOCYTOPENIA.*

By MARTHA EKOLA STROLBERG, M.T. (A.S.C.P.)
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Granulocytopenia has been the subject of an increasing number of contributions to hematological literature during the past decade. It has been recognized by a number of terms, the most common names having been: granulopenia, agranulocytosis, agranulocytic angina, neutropenia, and malignant neutropenia. The majority of the articles have been concerned with the etiology; each new chemical or drug, as it has been adopted, has been considered as a possible etiological factor. Since Madison and Squier (1) published in 1934 their evidence against amido-pyrine, and confirmed its role as a contributory factor in this syndrome, many have submitted excellent reviews and classifications of granulopenia.

Rosenthal (2) has discussed the various aspects of this dyscrasia very thoroughly in the chapter entitled "Agranulocytosis" in Downey's "Handbook of Hematology". Boyer (3) has given a condensation of Haden's (4) classification of granulopenias as follows: (1) those with a decrease in erythrocytes and platelets from aplasia or hypoplasia of all bone marrow cells; (2) those due to mechanical interference with the delivery of mature granulocytes; and, (3) those due to selective interference with the multiplication, maturation or delivery of granulocytes from the marrow.

Plum (5) has made an exhaustive study of agranulocytosis, and written a monograph on the subject, with special reference to the etiology, Gordon (6) has summarized the prevailing opinion very concisely, concluding that the cause is still debat-

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able. Bethell et al (7), in their abstract of recent literature on granulocytopenia, have listed as possible causes the following: chronic infections and illness: severe sepsis, toxic substances affecting bone marrow activity, chemical and drug poisoning, secondary invasion by bacteria in tissues with lowered resistance, allergy, endocrine disturbances, and lastly, a possible congenital absence of a necessary substance in the bone marrow, which makes a person susceptible to the development of leukopenia.

A few authors have emphasized the importance of quantitative and relative changes in the cells of the circulating blood in agranulocytosis. Hoff (8) has pointed out the importance of differential counts, having described a case with an unusually sustained high total leucocyte count, due to an absolute increase in lymphocytes and monocytes. Reznikoff (9) has reviewed 13 cases of agranulocytosis; he felt that fatigue was a prominent predisposing factor in 11 of those patients. He has observed that monocytosis is an evidence of good prognosis; to be significant, the monocytosis must occur early in recovery and must persist. Arneth (10) has stated that monocytosis generally has been conceded as a favorable sign, but the two cases where he noted it, both succumbed to the disease.

Mirick (11) has reported on 17 cases of "pure" agranulocytosis following gold therapy. He has concluded that the prognosis may be judged by: the degree of neutropenia—an absolute count of 30 granulocytes per cu. mm. being a very unfavorable sign—; and, eosinophilia—its presence signifying a hopeful prognosis. All of his cases which had over 8% eosinophiles recovered, even though a complete agranulocytosis followed. Ringoen (12), who has contributed to the science of Hematology the most widely accepted and best-proved theory on the development of eosinophiles, has discussed their maturation, reactions, and significance in the chapter on "Eosinophile Leucocytes and Eosinophilia," in Downey's "Handbook of Hematology." He has described the variations in the straining reactions of the specific granules of these cells, and has considered as immature those granules which show basophilia and "amphophilia."

Very few authors have considered the morphology of cells of the peripheral blood in granulocytopenia. Arneth (10) has ex-

pressed the opinion that the qualitative study of the blood cells is still of primary value, and that bone marrow studies will contribute very little more as an aid in diagnosis and differentiation from other leukopenias. Fitz-Hugh (13) has called attention to a relative and absolute increase in neutrophilic myeolocytes in the circulating blood in cases recovering from this disease. He has stated that recovery is initiated by a myelocytic hyperplasia of the bone marrow, and a "myelocytic crisis" in the peripheral blood, with an extreme shift to the left in the neutrophiles, with sometimes a concurrent monocytosis; this early recovery phase is followed by a return to the circulation and tissues of normal neutrophiles and other leucocytes. Rosenthal (2), in his discussion of agranulocytosis, has described the morphological details of the blood and bone marrow cells. He has noted a shift to the left, and a heavy toxic granulation in the neutrophiles, and the presence of recticulo-endothelial cells and macrophages, and has illustrated these findings in photomicrographs. Waitz and Hoerner (14) have described an abnormal azurophil granulation in cells of the blood, some of them suggesting "Auer Bodies," in a case which was a diagnostic problem. They have stressed the fact that in their case, an anaemic and agranulocytic syndrome with a myeloblastic reaction, the qualitative and quantitative studies of the peripheral blood did not suffice to secure a diagnosis. They have concluded that the study of the bone marrow is invaluable in the differentiation of granulocytopenia with a myeloblastic reaction from leukopenic leukemia.

The morphological study of bone marrow has received more attention than has the peripheral blood. Rohr (15), Jagie and Fleischhacker (16), Fitz-Hugh and Krumbhaar (17), and Arneth (10), all have done extensive work on the bone marrow in agranulocytosis. As Fitz-Hugh has stated, "the original view of 'aplasia' of myeloid cells of the bone marrow is now considered incorrect, although a terminal aplastic phase (of necrosis) is admitted." Most of these authors have given special attention to the evaluation of bone marrow puncture as a diagnostic aid. With the exception of Arneth (10), they have found the procedure of value in the differentiation of the agranulocytic syndrome from other conditions where leukopenia and neutropenia are outstanding features. They have concurred with Fitz-Hugh

(13) that the recovery phase is characterized by a "myelocytic" hyperplasia of the bone marrow. Waitz and Hoerner (14) have described an intense reticular and endothelial reaction in their case. This activity, both "medullary and extra-medullary," besides the presence of large "reticular cells and plasmocytes" in the bone marrow, they have interpreted as being significant and suggestive of agranulocytosis, and a feature which is helpful in the differentiation of this disease from leukopenic leukemia.

A relatively new disease entity, which is also characterized by a profound granulocytopenia of the peripheral blood, has been reviewed by Rogers and Hall (18). This condition has been named "primary splenic neutropenia." The authors have stated that theirs is the 8th case of this malady thus far described in the literature. They have listed as findings in this syndrome, besides the profound neutropenia, splenomegaly, thrombopenia, and myeloid hyperplasia of the bone marrow. It has been suggested that it is closely allied with the syndromes of thrombopenic pupura and hemolytic icterus; that the spleen either destroys neutrophiles in excessive numbers, or inhibits the development of granulocytes in the bone marrow. A cure follows splenectomy, and the normal leucocyte and granulocyte levels are established after splenectomy.

In this presentation of a case of granulocytopenia with recovery, attention has been focussed on the morphology of the cells as well as their quantitative changes in the peripheral blood. The findings in the blood studies have been tabulated for presentation in Table I. Other pertinent data from the case history has been presented in Table II.

Case History

The patient, D.K., a white female, age 21, unmarried, by occupation a practical nurse, was admitted to the Minneapolis General Hospital on May 16, 1936. Shortly following her menstrual period, she thought she was developing a "head cold." Two days before admission she suffered from headaches, malaise and anorexia, the symptoms increasing in severity. On the day of admission she felt soreness of the throat and pain on swallowing, was feverish, and noted generalized aches. Her private phy-

sician diagnosed Streptococcic throat, and advised hospitalization. The history otherwise was negative for upper respiratory disease. No drugs had been used except aspirin, gr. X, a "couple times" during headaches, and one tablet of nembutal. Her general health had been good. She had had measles, chicken pox, whooping cough, and mumps in childhood, and a tonsillectomy and adenoidectomy in 1933. On admission her temperature was 104°, pulse 96, respiration 22.

The physical examination was negative, excepting the coated tongue, and deeply injected and swollen throat. The tonsillar fossae were clean, with no ulcers. The neck showed a bilateral small cervical adenopathy. The liver and spleen were not palpable. The impression of the admitting physician, 5/16/'36, was Streptococcic throat, with bilateral cervical adenopathy. The medical resident's impression was acute pharyngitis, agranulocytic angina.

The patient was hospitalized for 25 days, received 6 citrated blood transfusions, was given orally 25-30 capsules of bone marrow, or spleen-bone marrow extract, daily, and liver extract and pentnucleotide intramuscularly.

During the course of this illness, when ulceration of the throat appeared, a smear of the throat was found to be positive for Vincent's organisms. One throat culture was positive for hemolytic streptococci, with throat cultures negative for these bacteria on other occasions. Repeated blood cultures were negative. The study of the peripheral blood was carried on throughout the course of the illness and the period of recovery. No bone marrow studies were made.

The patient was discharged on 6/10/'36, her condition "improved." The final diagnosis was: (1) Agranulocytic Angina; (2) Vincent's Angina.

Discussion

In ten detailed studies of the peripheral blood, relative counts made on the basis of 300 cells when the total W.B.C. count was 500 and less per cu. mm., and on 500 cells in the others. All percentages were figured to the nearest unit, to eliminate fractions.

Date	Day in Hosp.	H.C.B. % Sahli	R.B.C. per Cu. mm	Total W.B.C. per cu. mm	DIFFERENTIAL COUNTS OR HEMOGRAM																					
					Total P.M.Ns.		Pro-Myelo		Myelo		Meta Myelo		Band Neutro		Mature		Hyper-Segment		Eos.		Baso.		Lymph		Plasma Cells	Mono-cytes
					Abs. No.	%	% of P.M.No.	% of Tot.	% of P.M.No.	% of Tot.	% of P.M.No.	% of Tot.	% of P.M.No.	% of Tot.	% of P.M.No.	% of Tot.	% of P.M.No.	% of Tot.	% of Tot.		% of Tot.		% of Total		% of Total	% of Total
5/16/36	1	82		500																						
5/17	2			175	2	1					100%	1											97			2
5/18	3	77		150 200	15 20	10																	84			6
5/19	4	78		250 500	5 10	2																	94		1	3
5/20	5	81	1,450,000	500	15	3																	89		2	5
5/21	6	86		900																						
5/22	7	90		900	32	8			38%	3	50%	4			12%	1							82			10
5/22	7			2,300	1056	48	8%	4	24%	12	46%	22	20%	9	2%	1						1	27		3	21
5/23	8				51	8%	4	23%	12	23%	12	37%	19	7%	3	2%	1						23		4	22
5/23	8	97		2,300	946	43																	45			12
5/23	8	100		2,900	1120	40																	54			6
5/24	9			5,900 5,900	2655	45																	44			11
5/25	10			6,950	9650	67																	27			6
5/25	10					74			7%	5	9%	7	27%	20	37%	42							10		1	15
5/26	11			8,200	6478	79																	14			7
5/26	11					78			3%	2	10%	8	31%	24	36%	44							15			7
5/27	12			9,200	8004	87																	11			2
5/28	13																									
5/29	14			9,400	7802	83																	15			2
5/29	14					60			1%	1	4%	3	13%	8	82%	48			12	2	23			3
5/30	15					63			1%	1	1%	1	7%	4	91%	57			10	2	18			7
5/31	16					63			1%	1	3%	2	10%	6	83%	52	3%	2	9	1	22			5
6/1	17	-103		9,800	6664	68																	25			7
6/2	18																									
6/3	19			7,100	4402	62													2				29			7
6/4	20			7,550	5210	69																	24			7
6/5	21			7,000	4830	69																	23			8
6/6	22			6,900	4556	67																	27			6
6/7	23			6,800	3812	63			2%	1	2%	1	8%	5	86%	34	3%	2					25			12
6/8	24			7,600	5092	67														1			26			6
6/9	25			6,500	4290	66																	25			9
6/10/36			Patient Discharged		Blood Picture Essentially Normal																					

TABLE I.

For the first seven days after admission, the total leucocyte count fluctuated between 500 and 150 cell per cu. mm. On the second day, when the total W.B.C. level was at 175 per cu. mm., only 1% of them were neutrophiles, all metamyelocytes, an absolute count of 2 per cu. mm. Of all the cells, 2% were monocytes, and the remainder were lymphocytes.

On the seventh day, the leucocyte level rose from 400 to 2,200 cells. In the blood smears taken when the W.B.C. count was 400,

Day in Hosp.	Date	PATIENT—D.K.				THERAPY						LABORATORY							
												BACTERIOLOGY			URINALYSIS (Reg. Neg.)				Mic.
		Temp.	Throat	Pelvic	Gen'l. Condition	Mouth Hyg.	Liver Extr. I.M.	B. Mar. Extr. Oral	Spleen B. Mar. Extr. Oral	Pentnucleotide I.M.	Blood Transfusions	Blood Cult.	Throat Cult.	Throat Smear	Sp. Grav.	Alb.	Casts	Pus	RBC.	
1	5/16/36	104°	Injected Swollen no Ulcers		Pulse 90s Resp. 22		6 cc	As Tolerated 25–30				REPEATEDLY NEGATIVE	ONE POSITIVE—HEM. STREP. TWO NEGATIVE		1.021	Trace	Neg.	Few	OCC.	
2	5/17						6 cc				300 cc									
3	5/18							25–30			400 cc				1.014	1+	Few Gran.	Few	Neg	
4	5/19						3 cc	12			400 cc									
5	5/20						3 cc		25–30	10 cc	400 cc									
6	5/21		Ulcers Appear	Slight Mucous Blood		Wash and Hot Gargle	3 cc		25–30	10 cc	400 cc			Pos. Vincent's						
7	5/22						3 cc		25–30	10 cc	400 cc									Retic. 0.7%
8	5/23	99.4°	Ulcers Larger	Injected Vaginal Mucosa			3 cc		25–30	10 cc										460,000 Plate-Lets.
9	5/24	98.6°	Ulcers Clearing				3 cc	15–20		10 cc										
10	5/25				Much Improved			25–30												
11	5/26				Continues to Improve			25–30												
12	5/27							25–30							1.030	Faint Trace	Neg.	Few	OCC.	
13	5/28							25–30												
14	5/29							25–30												
15	5/30							25–30												
16	5/31							25–30												
17	6/1				CONTINUES TO IMPROVE	CONTINUED		25–30							1.016	Trace	Occ. Gran.	50–100	OCC.	
18	6/2							25–30												
19	6/3							25–30												
20	6/4																			
21	6/5							Dis. Continued												
22	6/6																			
23	6/7							25–30												
24	6/8							25–30												
25	6/9							Discont							1.015	Trace	Neg.	Few	Neg.	
	6/10/36	Discharged, Condition "Improved"													Sed. Centrif. & Per High Power Field					

TABLE II.

there were 8%, or 32 (absolute count) neutrophiles, of which 12% were mature (1 in 8), 50% were juvenile forms or metamyelocytes (4 in 8), and 38% were myelocytes (3 in 8). At this time there were 10% monocytes and 82% lymphocytes. In relative numbers, the myelocytes reached their peak here, although the absolute number was low, only 12 per cent cu. mm. (38% of 32 P. M. N.'s).

Later in the day, when the total count reached 2,200, the study of the blood smears revealed that the neutrophiles had risen to 48%, or 1,056 per cu. mm. Of these 2% were mature forms, 20% were band or "stab" forms, 46% were metamyelocytes, 24% were myelocytes (or 253 per cu. mm.), and 8% were promyelocytes (84 per cu. mm.). A number of the myelocytes

(9% of them) had ring-form nuclei. All of the neutrophiles had very heavy toxic granulation. These "toxic granules" were irregular in size and shape, appeared coarser, and stained more intensely than ordinarily, approaching the color of the metachromatic granules of basophiles. The basophiles made up 1%, lymphocytes 27%, plasma cells 3%, and monocytes 21% of the total W.B.C. (absolute number, 462 monocytes per cu. mm.).

Many monocytes were abnormal; 23% of them showed reticuloendothelial characteristics in the structure of the nucleus, and 55% of them had heavy azure granulation. These "toxic azure granules," irregular, coarse, and stained a bright azure hue, replaced or obscured the "dust-like" azure granulation normally found in monocytes. One reticulo-endothelial cell was found at this time, which was classified as a monocyte in the count because it appeared to be a transitional form with monocytoid features. It contained a large azure-stained rod in its moderately basophilic cytoplasm, a structure resembling an "Auer Body." Two other similar cells, appearing to differentiate into lymphocytes, were found and classified in the count as lymphocytes.

The majority of the lymphoid cells showed a moderate to marked basophilia of the cytoplasm, with a rough, flaky appearance of the spongioplasm, the clear hyaloplasm showing through in small patches, sometimes suggesting vacuolization. A few lymphocytes had definite vacuoles, and occasional lymphocytes had azure-stained, droplet-form granules. Most of the lymphocyte nuclei showed a marked condensation of the chromatin, forming a definite "checkered" pattern. These cells have been referred to as "irritation lymphocytes," and also have been interpreted as indicating a "shift to the right" in the lymphoid elements. Some small degenerating forms, with pycnotic nuclei and relatively small amounts of cytoplasm, were present. A few lymphocytes had "smooth" nuclei, with the chromatin pattern smudged or obliterated. They did not have the fine chromatin distribution and nucleoli of very immature lymphocytes, nor did they resemble the slightly immature lymphoid cells found in chronic and subacute lymphatic leukemia. The few plasma cells found (3% of W.B.C.) were typical in their morphology.

On the 8th hospital day, the total count remained at the same level, while the neutrophiles increased to 51%. There were occasional hypersegmented forms, with five or more lobes in the nucleus, which comprised 2% of the P. M. N.'s. The mature cells rose to 7%, the band forms to 37% of the neutrophiles, the metamyelocytes fell to 23%, and the myelocytes and promyelocytes remained at their previous relative numbers. Monocytes also remained at the high level of 22% of the total count, and plasma cells were at their peak at 4% of the total W.B.C. It was on the seventh and eighth days, that the "myelocytic crisis" was apparent in the peripheral blood. There was also a moderate monocytosis, and there were occasional cells suggestive of "reticular cells" at this time. A marked toxic granulation in all neutrophiles, and a heavy azure granulation in the monocytes persisted. A "shift to the right" in the lymphoid cells, and the presence of plasma cells was noted.

In the subsequent studies, on the 10th, 11th, 14th, 15th, and 16th hospital days, there was apparent a shift to the right in the neutrophiles, and a gradual stabilization of the relative counts. The peak of the total leucocyte count was noted on the 17th day, when it reached 9,800 cells per cu. mm. The toxic granulation in the neutrophiles became more sparse, the finer granulation normally present, replacing it, and the heavy azure granulation in the monocytes gradually decreased in amount. "Toxic budding," irregular bud or thorn-like protuberances from the edges of the nuclear lobes, was noted consistently in the neutrophiles in the blood smears of the 10th to 16th days. In many of these cells, the nucleus appeared smudged, with the "myeloid" chromatin pattern effaced.

Eosinophilia, relative and absolute, was first noted on the 14th day after admission, when 12% of the 9,400 W.B.C. were eosinophiles. Of these, 79% contained some basophilic and amphophilic granules, interspersed among the typical "mature" eosinophilic granules of the cytoplasm. The nuclei of these cells were generally bi-lobed and appeared mature. This eosinophilia, which was noted on three successive days, was not followed by a neutropenia; the blood picture continued to show a gradual return to normal.

The final morphological study of the blood in this case was made three days before the patient was discharged from the hospital. The total leucocyte count was 6,050; the neutrophiles made up 63% of the W.B.C., the absolute number was 3,812 P.M.N.'s per cu. mm. Of these, 85% were mature, 8% were band forms, 2% were juvenile forms, and 2% were myelocytes. These cells still contained in the cytoplasm a moderate toxic granulation, with only very occasional neutrophiles showing the coarser, darker granules seen in previous smears. The monocytes averaged 12%, and, with the exception of a very occasional cell, were normal in morphology. The lymphocytes, 25% of the W.B.C., also were normal in appearance, with only a few small degenerating forms present. The blood picture was considered essentially normal.

The erythrocytes and platelets, judging from the blood smears, remained normal throughout the course of this illness, and during the patient's recovery from agranulocytosis.

Summary

Some of the literature on granulocytopenia has been reviewed briefly, with special reference to the qualitative and quantitative changes in blood and bone marrow cells.

A case of agranulocytic angina with recovery has been presented. Available data has been tabulated to offer a summary of the findings, and to show their relationships.

A qualitative study of the cells of the peripheral blood has proved to be invaluable in the diagnosis and estimation of prognosis in the case presented. A "myelocytic crisis," with a simultaneous relative and absolute monocytosis, was noted. Reticuloendothelial cells were present at the same time. Eosinophilia was evident when the recovery phase was well established, and the "myelocytic crisis" had subsided. A typical toxic granulation in neutrophiles and monocytes was a prominent feature. At no time was the morphological picture suggestive of a leukemic process.

It is regrettable that no bone marrow studies were made. Although the differentiation between agranulocytosis and other

neutropenic conditions was not a primary concern, the examination of the bone marrow would have contributed information on a possible aplasia or hypoplasia, or an arrest in the development or release of myeloid elements. It might have given some indication of the prognosis during the most profound leukopenic phase.

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THE TECHNIQUE OF HEART INJECTION FOR STUDY AND PHOTOGRAPHIC REPRODUCTION*

P. BERNARDO BUNOAN, BSc, M.T.

While working under the supervision of the late Dr. Louis Gross, Director of the Mt. Sinai Hospital Laboratories in New York, the writer learned the procedure for injecting the heart in order to prepare it for study of diseases within the cardiac circulation as well as of other vascular disturbances. In response to numerous inquiries as to the technique employed, the following procedure is being recorded in order that the methods developed by Dr. Gross be made accessible to those who desire to use them. The methods are those which were developed by Dr. Gross and due acknowledgment is made.

Technical Procedure

Immediately after the heart is removed, it is washed carefully with cold water to remove all blood from the chambers and is then placed in the refrigerator until it is ready for injection. It is preferable to inject the heart at once, if possible, because the vessels are still flexible. In order to inject the coronary arteries of the heart, glass cannulas are inserted into their orifices and are tied into the vessels with silk thread. The heart is suspended on a tripod by means of a glass rod which is inserted into the pericardial bridge connecting the great vessels. The heart thus suspended is placed in the larger chamber of the injection apparatus illustrated in this article. Warm saline solution (45° C.) is forced through the coronary arteries until the washing is free from blood (this takes about 15-20 minutes). The pressure at which the washing is carried on should be about 180 mm. Hg.

* Read before ASMT Convention, San Francisco, June, 1946.

The pressure tube is now applied to the inlet of the Wolff bottle which is mounted on the rocker which contains the injection medium. If the injection medium consists of a suspension, such as barium sulphate in gelatine, the rocker is set in motion so as to keep the medium uniform. The injection medium is forced through the outflow tube of the Wolff bottle through the cannulas into the coronary arteries. The pressure is again maintained constant.

Formula for Barium Sulphate Suspension

Barium Sulphate	1000 gms.
Gelatine (French Gold Label)	300 gms.
Thymol	2 gms.

Soak 300 gms. of fine French Gelatine (gold label) in 1200 cc. of distilled water. To this add 1000 gms. of finely-powdered barium sulphate, 100 c.c. of distilled water and 2 gms. of thymol. Heat over a water bath with care.

When the arteries are completely injected, two clamps are placed on each rubber tube connected with the cannulas and the rubber tubing is cut between the clamps. The arteries are known to be completely injected when the column of mercury in the manometer *does not fall*. This point is usually reached in 20 to 30 minutes. The heart is then immediately plunged into cold water. Excess of barium sulphate is washed out of the heart chambers by a stream of cold water or by means of suction and then the heart is immersed in 10% formalin. After 24 hours, the heart is ready to be photographed or X-rayed and can be studied. If it is desired to render the heart transparent, the Spalteholtz method or a modification may be used.

The glass cannulas are best made in the laboratory by the following method. They must be strong and at the same time fine enough to be inserted into the coronary arteries of newborn infants. Pieces of glass tubing having a 3 mm. internal diameter, a 5 mm. external diameter and 15 cm. in length are used. The center of the tubing is softened in the flame of a blow-pipe, slightly thickened and drawn. The drawn ends are nicked with a file about 1 cm. from the slope of the shoulder and broken off.

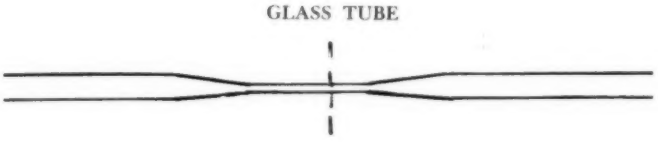

Fig. 1

Fig. 2

The nozzle of the tube is dipped into talcum powder. A teasing needle is also dipped into talcum powder and its point is inserted into the lumen of the nozzle. The tube is slowly rotated and the point of the needle is gradually introduced into the flame of a blow-pipe. It is necessary that the flame be kept small. The tip of the nozzle immediately begins to thicken and its lumen is kept open by the needle. The purpose of the talcum powder is to prevent the needle from fusing with the glass. When the desired thickness of the flange is obtained, the tip is removed from the flame and the opposite end of the tube is rounded in the flame. (Fig. 2.)

Method Employed in Photographing Injected Heart Specimen

The first step is to photograph the whole heart which has already been injected. To do this the light box, designed by the author and published in the Journal of the Biological Photographic Association in 1932, is used.

The next step is to take the X-ray of the whole heart. The technical factors employed are simple. The technical factors are as follows:

KvP	40	Distance	30″
Ma	10	Time	10 sec.

After the photographs and X-rays of the whole heart are finished, the heart can be cut into cross-sections (2 cm. thick), starting from the apex or from the base. The cross-sections of the heart are arranged for photographs and X-rays employing the same method and factors as described above.

After the injected heart is treated according to the Spalteholtz method or its modification and is preserved in oil of wintergreen, photographs can be taken. In general, this type of work is very difficult and a device is necessary to hold the heart in position just beneath the surface of fresh oil of wintergreen because some parts float above the surface and others sink to the bottom of the container. The technician will be compelled to adjust the manner of holding the heart in position with each heart because they vary in their ability to float in the oil of wintergreen. The light box is again used in taking the photographs. Ortho Hammer plates are used because they have been shown to give better negatives for printing.

Histological sections are often required from the injected heart for study and for photomicrography. Dr. Louis Gross described a standardized procedure for microscopic study of the heart. The heart is opened in the customary manner after injection and fixation, and the following blocks are cut: (1) left auricle (L.A.); (2) mitral valve posterior (M.V.P.); (3) post-papillary muscle (P.P.M.); (4) aortic valve and mitral valve (A.M.V.); (5) pulmonary artery and valve (P.A.V.) and (6) tricuspid valve (T.V.).

These blocks from the heart (injected or not) are fixed in neutral formalin sodium chloride solution. If the tissues are fresh (less than 6 hours post mortem) Bouin's fluid is found to be satisfactory. After 24 hours fixation, they are washed under running water for at least 12-24 hours. Then they are run through according to the usual procedures.

At least two sections from each block should be stained, one with hematoxylin and eosin, and the other with some good stain for differentiating elastic and fibrous tissues, such as Weigert s stain for elastic tissue and van Gieson's for fibrous tissue. We have found the McCallum-Goodpasture or azure-B stains satis-

factory for staining bacteria. Weigert's stain or Mallory's phosphotungstic hematoxylin bring out fibrin very well.

After the sections have been stained and the field to be photographed has been marked, prepare a set-up in the photomicro-apparatus depending on the magnification and size of the picture desired. When the set-up is correctly adjusted, you are ready to determine the time of exposure. With experience the worker in this field of photography usually accumulates a sufficient amount of more or less empirical data to enable him to estimate the exposure time necessary in any particular case. In any event, it can be determined by trial and error. This, however, involves a waste of time and material, even for the expert, and would be a hopelessly involved procedure for the novice.

To avoid guess work in this field of photography, a photo-electric exposure meter is employed to determine the exposure time. The author has employed this instrument in taking photomicographs. This photo-electric exposure meter was first introduced in the Mt. Sinai laboratory and is entirely different from other known exposure meters devised in the knowledge of the writer. It was illustrated and published in the Journal of Biological Photographic Association in June, 1933.

Now the X-ray films and negatives, including the photomicrographs of the sections of the heart are ready for printing, enlarging and making of lantern slides for lectures, publications and exhibitions. The X-ray film of the cross-sections of the heart should be retouched and blocked. Some of them are too small for printing; therefore, they should be placed on a piece of black paper with a hole large enough to expose the part of the heart. The black paper should be cut to the size of the regular printing papers (4′ x 5′) and (5′ x 7′). It is advisable to use the best printing solutions and papers.

The method outlined above and the accompanying illustrations are offered to those desiring to employ this procedure with full knowledge of the fact that many small details in technique, which are essential for good work, can only be acquired with practice. The more important salient features alone have been emphasized, but it is hoped that sufficient data has been presented to enable those who are interested to modify the technique to meet their own needs.

WHAT ARE WE DOING ABOUT IT?—An Editorial

Medical technology includes many branches. The bio-chemist the hematologist, the bacteriologist, the histologist, the urine analyst, the serologist, the parasitologist, and the person whose field encompasses a small part of each, all may call themselves medical technologists. Their work may be in a large or small hospital, a large or a small clinic, with a group of perhaps twenty-five doctors, or possibly for just one doctor in his office, or in a public health laboratory in the state capitol, or in a smaller branch laboratory where the "director" assists his assistant in the routine work. A few may be in research laboratories. Many are in laboratories which are for the purpose of enabling those physicians whose establishments do not call for a laboratory within its own bounds to call upon its facilities when he needs them.

The education of a medical technologist varies from that in the early days before the Board of Registry when the "laboratory technician" was, to quote from a recent article *appearing in this publication, "usually a privately trained routine helper, often without the necessary educational background," to that which is much more usual today, college training, with one or more degrees, frequently in Medical Technology itself. The Board of Registry has been the factor which first gave impetus, and now stability, as well as credentials, to medical technology as a profession. Without the recognition of the problem by the pathologists, we would be still in that same unformed, unorganized status, of laboratory "worker." Since the time of the Registry's beginning, we have had something tangible as a nucleus. The organization of local, state and national societies based upon those people carrying credentials of proficiency has been another step forward.

* The Future of Medical Technology, by Kano Ikeda, M.D. (Vol. 12, No. 4, July, 1946.)

Now the problem lies in our own development. We have the foundations. We know we can depend upon our standard-setting body for permanence and development with the times. The responsibility lies with us, to recognize those developments as they appear, to see that the trend is ever toward more education and better training of the medical technologist, whether in one field or in many, to accept the fact that the specialist in one branch of medical technology, with his intensive college training in that specialty, as well as his experience, is a medical technologist of first calibre. In each single branch of our profession, there are not enough individuals to band together as a separate group. These individuals are needed to join with us in the American Society of Medical Technologists. The need is mutual. We should have every MEDICAL TECHNOLOGIST A MEMBER OF THE AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS. WHAT ARE WE DOING ABOUT IT?

—R.M.

CORRECTION: In September Journal (1946), page 208, footnote, Dr. C. G. Culbertson, listed as formerly pathologist with the Illinois University Medical Center, was with the INDIANA University Medical Center.

IN MEMORIAM

Dr. Ivo A. Nelson, died on October 21, 1946, at his home, 2820 E. Tenth Street, Tulsa, Oklahoma, after a two-year illness from a heart ailment. In his death medical technologists have indeed lost a friend. As a member of the Board of Registry from 1943 through 1945, when his illness became so that he could no longer carry on his work, Dr. Nelson proved his sincere interest in medical technology as a profession. His were practical suggestions, one of which stands out so clearly — in a talk before those in attendance at an ASMT convention — the consideration of manual dexterity and ease in the handling of laboratory glassware as a criterion of the aptitude of a would-be medical technologist for his chosen profession. We shall remember Dr. Nelson as one who will continue to guide us through those of his and our professions with whom he was most closely associated.

AMONG THE NEW BOOKS

Several weeks ago a number of the major medical book companies were asked for their cooperation in providing books for review in this journal. To date we have had only a fair response. As this issue of the A.S.M.T. journal goes to press we are able to present three reviews. It is realized that many very timely and useful technical books may escape the notice of busy medical technologists unless there is some medium for attracting attention to the new and worthwhile scientific books.

In the future every effort will be made to secure and review as many books as possible in this journal. Occasionally it will be necessary to review books which are not strictly pertinent to medical technology, but rather on a related phase. If a publisher sends us such books for review it will be necessary to give a brief review in acknowledgment of their courtesies to this organization. We hope to be able to present reviews on the new books within sixty to ninety days after the publishers' release. Books on bacteriology, chemistry, immunology, mycology, parasitology, serology, as well as those on general laboratory methods will be reviewed as published.

In the January, 1947, issue, article abstracts will again take precedence in the Book Review and Abstract Section.

PRACTICAL MALARIOLOGY: Prepared under the auspices of the Division of Medical Sciences of the National Research Council. Paul F. Russell, M.D., M.P.H., Colonel, M.C., A.U.S., Parasitology Army Medical School Field Staff, International Health Division, Rockefeller Foundation (on leave); and Luther S. West, Ph.D., Head of Biology Department, Northern Michigan College of Education, Major Sanitary Corps A.U.S. (Reserve); formerly Entomologist, Parasitology Division Army Medical School; Reginald D. Manwell, SC.D., Professor of Zoology, Syracuse University, New York, Formerly Captain Sanitary Corps, A.U.S., Protozoology Section, Parasitology Division, Army Medical School. Foreword by Raymond B. Fosdick, President of the Rockefeller Foundation. 684 pages, 238 illustrations, 8 in color. Philadelphia and London: *W. B. Saunders Company*, 1946. Price $8.00.

This book measures up to all the title implies; it is inclusive; it is written by three men whose clinical experience with the malaria problem during World War II made it possible to produce a book covering the subject in its entirety without resort-

ing to encyclopedic proportions. The style is free and the reading easy. Ambiguous terms are clarified, thus making it possible for even undergraduate college students to use this book as a reference text in zoology courses.

The authors begin by giving a lucid historical survey which is followed by the six sections. Section I consists of four chapters devoted to the malaria parasite including such topics as the Host Range and Life Cycle, morphology and physiology of the human and animal plasmodia, and most important of all the essential laboratory and field technics of proven value. Section II is devoted to the Mosquito. Its morphology, taxonomy, bionomics and distribution are discussed. A chapter on field and laboratory technics is included. In section III Malaria in Man is taken up in detail. Full chapters are devoted to the pathology, clinical aspects, treatment, immunity (including latency and relapse), and Blackwater fever. Section IV deals with the community aspects of malaria, and Section V takes up prophylaxis and control. Section VI is a single chapter on therapeutic malaria. An appendix supplies keys to world anopholines.

Certain chapters in this book are of particular interest to medical technologists, especially those dealing with technics which aid in establishing the diagnosis of malaria. The appearance of both the unstained and stained parasite is given in considerable detail. The characteristics of the four human types of malaria are given in tabular form thus making ready reference possible at a glance. Criteria for differentiation between the various human species are set forth. Among the technics and procedures of special interest are those of the Army Medical School. These include the making, staining and reading of routine smears, the preparation of tissue smears and sections, the demonstration of exflagellation, parasite counts, the preservation of parasites, the serology of malaria, and the preparation and formulae of stains and solutions.

In the chapter dealing with the pathology of malaria one finds an excellent discussion of the blood picture in malaria. The bone marrow picture is also summarized.

Other items of interest in this book to the medical technologist are the technics for the determination of the various anti-

malarial drugs in the body fluids. Although not specifically related to medical technology, the chapter dealing with the clinical aspects of malaria is excellent and well worth the time required for reading it.

After perusing the entire book, the reviewer is convinced that this book fulfills adequately the need for a ready reference on malaria. The vastness of the malaria problem is presented conclusively.

PATHOLOGY OF TROPICAL DISEASES: By J. E. Ash, Colonel, M.C., U.S.A., Director, Army Institute of Pathology, Army Medical Museum; and Sophie Spitz, M.D., C.S., A.U.S., Pathologist, Army Institute of Pathology, Army Medical Museum. 350 pages with 941 illustrations, 15 in color, on 257 plates. Philadelphia and London: *W. B. Saunders Company*, 1945. Price $8.00.

Although written primarily for the tissue pathologist, this atlas should have considerable appeal for medical technologists. So often a medical technologist wonders just how does a certain tropical disease affect the human body, or what are the significant laboratory findings and, are any special tests necessary to establish the identity of these diseases. These questions are answered in this book which is profusely illustrated, which gives clear, concise discussions of the clinical features of the various tropical diseases and which evaluates the pertinent laboratory data.

The general plan of the book is as follows: virus diseases, bartonellosis, richetsial, tropical treponematosis, spirochoetal diseases, dysentery, bacterial diseases, leprosy, fungus diseases, tryposomiasis, leishmaniasis, malaria, nematodes, trematodes, cestodes infections are discussed under the following general outline:

Definition
Epidemiology including transmission
Etiology
Clinical features
Laboratory features (when particularly indicated)
Diagnosis
Pathogenesis
Pathology

Chapters on environmental factors and deficiency diseases are also included.

An exact method for stool examination is given in the chapter on dysentery. The procedures given are those which have stood up under the demands of war and epidemics in the Philippines, Middle East, and South Pacific. Procedures for the direct smear examination, iodine method, and the hematoxylin and eosin stained preparation are given. A most ingenious method for keeping a slide warm is, to quote: "the slide is kept warm by placing a heated penny on the end of it."

A table devoted to the differentiation of dysenteric stools is provided. This table evaluates the cellular constituents of a stool as seen in bacillary, amebic, or balantidial dysentery. In this chapter on dysentery there are 19 microphotographs which show various cellular findings in stool smears.

Practical laboratory suggestions are made when indicated. For example, under the heading of the identification of M. Leprae one reads: "In staining, the fact that M. Leprae is not quite so acid fast as M. tuberculosis must be taken into consideration; smears and tissues must be checked during decolorization."

The chapter on malaria is devoted exclusively to tissue pathology. No blood plates are given.

There are excellent charts showing the life cycles of the nematodes, trematodes, and cestodes.

The profusion of illustrations showing the exact pathology of the various tropical diseases gives this book appeal. The descriptions are written rather simply and without a great deal of technical pathological terminology. How the various agents of disease actually affect the human body is clearly shown because the plates show the gross appearance of the lesions. There are many plates devoted to the microscopic sections of these lesions.

As a reference text for students of medical technology, especially those interested in the problem of tropical diseases and their respective tissue findings, this book serves a distinct need.

A TEXTBOOK OF BACTERIOLOGY AND IMMUNOLOGY: By Joseph M. Dougherty, A.B., M.A., Ph.D., Dean of the School of Science and Professor of Bacteriology, Villanova College; Fellow of the American Association for the Advancement of Science; and Anthony J. Lamberti, B.S., M.S., Instructor of Bacteriology and Parasitology,

Temple University School of Medicine; formerly Instructor of Bacteriology, Villanova College; Member of the American Public Health Association. Introduction by John A. Kolmer. 360 pages, 102 illustrations. St. Louis, Mo.: *C. V. Mosby Company*, 1946. Price not given.

This book is a text of practical bacteriology. It is neither a strict text nor a laboratory manual; it is both. As a quick reference for the medical technologist it has a place because the principles of the various methods are given so clearly and concisely. The graphic presentation of the essentials furnishes a most direct approach to the laboratory procedures which are correlated with the textual material. Confusing terminology has been eliminated. The text is precisely written in a simple and direct style. The subject matter presented is exclusively inclusive, for the authors have sifted out the non-essentials. Each step in a bacteriological procedure is carefully explained and when indicated is accompanied by an appropriate illustration.

There are thirty-two chapters in the book. The chapter on the history of bacteriology is excellent and written in a surprisingly interesting manner. The material included in the book is: full discussion of microscopy (including dark-field and micrometry) yeasts and molds, apparatus used in the study of bacteria, preparation of culture media, staining problems, the morphological, chemical and physical differences of bacteria, effects of physical and chemical agents upon bacteria, infection, immunity, the procedures for quantitative titrations in bacteriology, blood work and an introduction to the principles underlying present day chemotherapy. The remainder of the book follows the usual plan of texts.

In the opinion of the reviewer this book is a well written, up-to-date book which definitely bridges the gap between theory and practice. It includes all the essentials necessary for a beginner's course and is detailed enough to meet the requirements of schools of medical technology. The striking feature of this book is its simplicity of style and the excellent co-ordination of the theoretical and technical aspects of the subject.

RECORDING SECRETARY AND TREASURER OF THE AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

The recording secretary of the ASMT, Sister M. Alcuin Arens, has held this office since July 1, 1944. In 1936-'37 she was Vice President of the organization. She is the basic science instructor for medical technology students at the College of St. Scholastica, Duluth, Minnesota. She received her B.S. degree at the College, and had her laboratory training and nurses training at St. Mary's Hospital. Her graduate work was done at the University of Minnesota. Sister Alcuin has taught in the parochial and high schools in Duluth, as well as in the College of St. Scholastica. She was supervisor of the laboratories at St. Mary's Hospital for six years where she also taught in the School of Nursing for three years.

She has had a number of papers published in the American Journal of Medical Technology, and has published two books on medical technology: "Clinical Laboratory Chemistry" and "Clinical Microbiology."

Sister Alcuin is a most valued member and worker in the ASMT as well as in her local and state societies. She worked on the Education Committee for two years and was the originator of the idea for the paper-writing contests. She is an associate editor of the AJMT and is editor of the Arrow, the local publication of the Arrowhead Society of Medical Technologists. She is a member of the committee on Professional Promotion in the Minnesota M. T. Association. Organizing the MSMT in 1937 was largely due to her efforts. She also promoted the idea of dividing the state into district societies.

Miss Loretta Laughlin, Treasurer of the American Society of Medical Technologists, has held that office for more than two years. During the two years previously, she had the herculean task of Programme Chairman, and had the added difficulty of a year in which the stimulus of the national convention was lacking. Loretta was an active member of the Indiana Society of Medical Technologists, in which she held the office of secretary, and is now active in the Minnesota Association, where she is this year's Paper-writing Contest chairman. She moved to Minnesota for the purpose of doing graduate work at the University of Minnesota. Miss Laughlin is a person who has the ability of accomplishing much and saying little.

NEWS AND ANNOUNCEMENTS

THE BOARD OF DIRECTORS VOTES

Since the close of the meeting of the House of Delegates of the American Society of Medical Technologists, it has become necessary for several decisions to be made by the Board of Directors of that body. At the convention the decision was made to assign to the Education Committee the duty of compiling a brochure of information on the profession of medical technology for distribution to high schools and colleges. As the Registry is publishing a new edition of their bulletin this year, the suggestion was made that the postponement of the booklet by our organization would be feasible. The Board concurred in this matter.

The Board also voted to mail the second edition of the ASMT Information pamphlet to all registered Medical Technologists not already members of the national organization. The bulk of this work will be done by the Executive office, but the affiliated societies will take note of the fact that if they take most of the responsibility upon themselves in their respective states, the gain will not only be to the national association but to that state organization. Nine thousand copies of this edition are being printed. Copies are available to individuals, to local and state societies, as well as to approved schools of medical technology. The suggestion is made to have the pamphlet available for distribution to registered medical technologists who are in attendance at medical, hospital association, and public health meetings. The state societies of Colorado, Oklahoma, and Minnesota have already notified us regarding intensive membership drives. REMEMBER INCREASED MEMBERSHIP BRINGS INCREASED REPRESENTATION IN YOUR NATIONAL ORGANIZATION. Pamphlets may be secured by writing to the Executive Office, Medical Center Building, Lafayette, Louisiana.

The Board of Directors voted that the 1947 convention of the ASMT in Denver, Colorado, be held on June 30, July 1 and 2, at the Hotel Shirley-Savoy.

The Board also voted to print a membership roster of the ASMT in the January Journal. To insure your name appearing correctly in this, be sure that the Executive Office has your correct address and that all dues have been paid the current year. All new memberships completed prior to December 15, 1946, will be included in the Roster.

COMMITTEE APPOINTMENTS—1946-'47

Programme: Miss Pauline Kurachi, Chairman, Colorado State Hospital, Pueblo, Colo.

Miss Eunice Reinhardt, St. John's Hospital, Springfield, Illinois.

Mr. Homer Spencer, Medical Arts Lab., 411 Med. Arts Bldg, Tulsa 3, Okla.

Exhibits—Technical: Miss Cecilia Korteum, Chairman, 1164 N. Dearborn St., Chicago, Ill.

Scientific: Miss Vondell Stewart, San Jacinto Hotel, Houston 2, Texas.

Miss Rose Hackman, 4200 E. 9th Avenue, Denver, Colorado.

Awards: Mrs. Caroline Herman, Chairman, 1612 Navarro Avenue, Pasadena 3, California.

Local Arrangements: Miss Elizabeth O'Toole, Chairman, 1345 Elati St., Denver, Colorado.

Miss Allyne Lawless, Co-chairman, 3420 West 30th Ave., Denver, Colorado.

Banquet and Luncheon Committee: Miss Mary Dille, Chairman, 1736 E. 17th St., Denver, Colo.

Miss Loretta Hamilton, Co-chairman, 1736 E. 17th St., Denver, Colorado.

Registration: Miss Virginia Wier, Chairman, Republic Bldg., Denver, Colorado.

Publicity: Miss Lavina White, Chairman, Pueblo Clinic, Pueblo, Colorado.

Entertainment: Miss Philippine Dixon, Chairman, 4200 E. 9th Ave., Denver, Colorado.

Sisters' Reservations: Sr. Mary Thecla, Chairman, Mercy Hospital, Denver, Colorado.

OUR NEWEST STATE SOCIETY

A state charter is in the process of being granted, and the Michigan Society of Medical Technologists is planning to affiliate with the national association on November 2, 1946, at the time of their fall meeting in Detroit. The afternoon of the meeting will be devoted to a scientific talk and demonstration. There will be a short business session followed by a dinner and "get acquainted" hour in the evening.

PROGRAM COMMITTEE—1947

To the Members of the A. S. M. T.:

Plan now to attend the 1947 annual convention. Insofar as the scientific program by the Medical Technologists is concerned, remember it will be only as good as your contribution.

The notice for the second annual national paper writing contest was published in the July journal. Briefly, the contest is open to all registered Medical Technologists, but only A.S.M.T. members are eligible to receive national awards.

Any phase of Medical Technology may be used for subjects.

The program committee urges members to submit papers. All who have written papers know the real personal value—reviewing the literature broadens one's knowledge, following the investigations of other workers in the field enlarges one's technique; it stimulates one to adopt procedures used by others as well as to originate modifications.

It is not only for a personal value we urge you to write papers but to do your part for a progressive society. From these papers not only are the award papers selected but program material. Start your paper now! Remember it must be in the hands of the chairman of the program committee by March 1, 1947.

The committee welcomes any suggestions and recommendations.

Watch the next issue for more announcements.

Pauline Kurachi
Colorado State Hospital
Pueblo, Colorado

PAPER-WRITING CONTESTS

By this time, no doubt, all affiliated state societies are entered in the nationally sponsored paper-writing contests. A resume' of the contest rules suggested by the national chairman, Sr. M. Alcuin, College of St. Scholastica, Duluth 2, Minnesota, is as follows: Contestants: Any registered medical technologist, but only ASMT members may compete for the national convention prizes.

Subject: A phase of medical technology, any of the six major fields makes a good theme: Biochemistry, Hematology, Parasit-

ology, Bacteriology, Histology or Serology. A narrative of experiences at home or abroad in laboratory work makes good reading.

Mechanics: Type, double spacing on 8½x11 in. white paper—four copies sent unfolded by first class mailing to state chairman.

Awards

State: First $..... (It is suggested that the awards do not
Second $..... compete with the ASMT awards.)
Honorable mention for other papers of merit.
Publication of prize papers in state journal (if one) and mention of papers of merit.
National: Cash and medal awards of ASMT—convention prizes to be determined by Board of Directors.

Publication of prize papers in the national journal and mention of papers of merit. (To be eligible for national prizes, writer must be a member of the ASMT, and must have paper read by proxy or must read his paper at the national convention.)

Committee on Awards: Each state appoints three pathologists as judges, and a medical technologist as chairman. The chairman is responsible for the papers. Sub-committees may be appointed to assist within the state and said committees act through the state chairman.

Memoranda: States may use the papers of their respective contributors to build up the scientific program for their annual state conventions. The Programme Committee of the ASMT annual convention may use the papers submitted by the states for a scientific program for the 1947 convention. Contestants will forward their manuscripts to their respective state chairmen, who, in turn, will forward the prize papers soon after February 1, 1947, to the Chairman of the Program Committee, Miss Pauline Kurachi, Colorado State Hospital, Pueblo, Colorado. The state chairmen will also forward to the national chairman a complete report of the contest in her state, giving the titles and authors of all papers submitted, giving the names of the winners of prizes as well as those meriting special mention, as soon as possibl after the contest closes in the state.

—Sr. M. Alcuin

NOMINATING COMMITTEE—1947

To the Members of the ASMT:

The Nominating Committee must offer a slate of candidates for offices of the ASMT to be voted upon by the House of Delegates at our next annual meeting in June 1947. The committee is very desirous to nominate capable individuals who will be representative of the membership as a whole. ASMT members can participate in this task by suggesting to the Nominating Committee names of individuals whom they consider to be particularly well qualified to hold office.

The offices to be filled are: President Elect, Recording Secretary, two members of the Board of Directors, and one member of the Advisory Board. When suggesting names for any of these offices, please state the person's qualifications, including their participation and experience in local, state and national organizations.

Suggestions should be mailed to one of the members of the Nominating Committee by *January 1, 1947*. It is planned to publish the slate of candidates in the March issue of the AJMT. This procedure will allow the membership time to consider the slate and for state societies to instruct their convention delegates if they so desire.

The Nominating Committee will carefully consider all suggestions received and earnestly hopes that ASMT members will take this opportunity to participate in the selection of a slate of candidates which will be a credit to our organization.

Miss Grace Ballard, Chairman
925 North 13 Street
Milwaukee 3, Wis.
Miss Elizabeth O'Toole
1345 Elati St.
Denver, Colorado
Miss Mollie Hill
2325 37th St., N. W.
Washington, D. C.

NOTICE OF CONVENTIONS AND SEMINARS

To State Societies: Please send notice of your annual or biannual meetings in order that such may appear in the Journal

prior to those events. Notices of Seminars will also be printed. In this way newcomers to your states who are readers of the Journal may locate the active organizations in his vicinity.

SCIENTIFIC EXHIBITS COMMITTEE

The Committee on Scientific Exhibits for the 1947 convention of the A.S.M.T. wishes to encourage state and local societies, as well as individual members, to submit such material as will lend itself to illustration and demonstration for exhibit purposes. These will be eligible for the convention awards. Necessary equipment for demonstrations will be available.

Watch the Journal for announcements and contact the committee chairman, Miss Vondell Stewart, St. Joseph's Infirmary, Houston 3, Texas, for further information.

FROM THE EDITOR

The editor wishes to acknowledge receipt of the following local papers and bulletins:

Technicians' Seminar, from the Medical Technologists of St. Mary's Group of Hospitals, St. Louis, Missouri.

The Arrow, from the Arrowhead Society of Medical Technologists, Duluth, Minnesota.

St. John's Tech-Knowledge, from St. John's Hospital, Springfield, Illinois.

The Bulletin, Quarterly Publication, from the Harris County Society of Medical Technologists, Houston, Texas.

Each of these publications carries splendid material. It would be appreciated if all local or state societies would send copies of their bulletins to the Journal, together with permission to use such material as should be available to all technologists.

How can others know what you are doing unless you send an account of your activities to the Journal? Please send such material to the editor, 2119 Arbor Avenue, Houston 4, Texas, before the 20th of the month prior to publication of the Journal. Suggestion to the presidents of these societies: Appoint some one person in your organization, and make him responsible for sending this word to the Journal—and be sure that it is sent on time for the current issues.

MINNESOTA

The officers of the various groups in Minnesota are in accord about the advantages that come from having a state divided into districts for medical technology. In the words of Miss Claussen, we express the sentiments of other officers: "All the latest A.S. M.T. members have joined through my last so-called Survey letter, and I am glad to find that the system of joining all three societies at one and the same time seems to be working out very well."

The Second District Society of Medical Technologists in the state of Minnesota met at St. Joseph's Hospital, Brainerd, Minnesota. Miss June Tyson, president, presided over an assembly that had gathered from Breckenridge, Little Falls, St. Cloud, Alexandria, Litchfield, Brainerd, with two guests from Duluth. Each member of the district society is planning to write a paper for the national paper writing contest, is meeting a "quota per capita" to raise the district's assessment for the State Service Fund, and in unison the members are going to conduct a survey of the medical technologist population in the district, paying particular attention to the number of "technicians" employed in the private offices of the medical profession, and, insofar as it is possible, get the nature of the day's work, the salary and the preparation for the "job." It is the consensus of opinion that there is indication for a lower level of medical technologist preparation than the present minimum requirements as set down by the Registry.

Submitted by Sister M. Alcuin.

PENNSYLVANIA

Pennsylvania Society of Medical Technologists and Laboratory Technicians Seminar Program, November 9, 1946, at the Philadelphia County Medical Society Building.

Use of Photo-electric Instruments in the Chemistry Laboratory—

Robert H. Hamilton, M. D., Professor of Physiological Chemistry, Temple University School of Medicine, Philadelphia.

Discussion of the Rh Factor—Harold W. Jones, M.D., Professor of Clinical Medicine, Jefferson Medical College, Philadelphia; Lowell A. Erf, M.D., Assistant Director of Hematology, Jefferson Medical College, Philadelphia.

Recent Advances in Routine Urinalysis—Irving J. Wolman, M. D., Director of Laboratory, St. Christopher's Hospital for Children, Philadelphia.

Problems in the Operation of a Blood Bank—S. Brandt Rose, M.D., Chief of Division of Bacteriology, Philadelphia General Hospital, Philadelphia.

The Handling of Small Biopsy Specimens—Ernest E. Aegerter, M.D., Director and Professor of Pathology Department, Temple University School of Medicine, Philadelphia.

Laboratory Aspects of Antibiotic Therapy—Amedeo Bondi, Jr., Ph. D., Assistant Professor of Bacteriology; Earl H. Spaulding, Ph. D., Associate, Professor of Bacteriology, Temple University School of Medicine, Philadelphia.

Discrepancies in Serologic Tests for Syphilis—Ad Harris, Serologist, U. S. Public Health Service, Marine Hospital, Staten Island, New York.

Fourteenth Annual Banquet with F. William Sunderman, M.D., Director of Chemistry Division Hospital of the University of Pennsylvania, Principal Speaker and Stanley P. Reimann, M.D., President of the American Society of Clinical Pathologists, Toastmaster.

Pennsylvania Society of Medical Technologists and Laboratory Technicians

Advisory Board: Miss Mary Eichman
Mrs. Kathleen Bradley
Miss Ellen Marie McDevitt

NOTICE

By-laws: Article VI, Section 6. Should read as in 1939 revision, "Editorials shall be written by the editorial board only, and all editorials before publication shall be approved by the Advisory Editors." Please insert the above section into your copy of the By-laws received with the July (1946) Journal.

THE TEXAS SOCIETY OF MEDICAL TECHNOLOGISTS

In this, the first of a series of articles about the organizations of medical technologists affiliated with the American Society of Medical Technologists, that society which was the first to file for affiliation will be featured.

On December 9, 1933, a group of laboratory technicians met in the Gunter Hotel, in San Antonio, Texas, for the purpose of organizing a society of members of their profession. Expressing the feeling of those present, one member stated: "My idea of the purpose of a state organization is to define a laboratory technician by establishing and maintaining standards of laboratory technic. Laboratory workers are coming into ever greater usefulness to the medical profession, and I feel we should be recognized as a definite profession with definite ideals and standards. This, I think, can best be accomplished by organization."

There were forty charter members in 1933. In May, 1937, the society was incorporated in the state of Texas. From the time of its affiliation with the ASMT in 1939, its members began to take an active part in the activities of the national organization.

A placement service was maintained for the membership for several years, and until the small number of technologists applying for new positions made such a service unnecessary. At one time a monthly bulletin was mailed to the membership. This contained copies of the papers which had been presented before the annual conventions, as well as news and announcements of importance to the members.

During World War II, the organizational activities were somewhat curtailed, as in other parts of the country, its members were unusually busy, as well as being in a state of unrest. The usual quota of members were in the armed services, or in service hospitals. Membership drives were non existent, but will be resumed as a part of the activities of the present year.

The TSMT has held annual conventions since its organization each year except in 1943 and 1945. Enough of its members were

also ASMT members at the time of the June 1946 convention of the latter organization, to make the maximum number of delegates possible. At present the TSMT is working on several projects, among which are the second paper-writing contest sponsored by the Education Committee of the ASMT, as well as membership drives for both state and local organizations. Its membership at this time is one hundred ninety-seven.

There are several local societies in Texas, but thus far no provision has been made for state affiliation. The state is divided into six districts, each of which has a representative on the Board of Directors. Sister M. Bridgetine Glass, Santa Rosa Hospital, San Antonio, has recently become president of the society upon the resignation of Mr. Paul Lea, who has left the state. Miss Barbara Bickle, Harris Memorial Methodist Hospital, Ft. Worth, has been appointed recording secretary to fill the unexpired term of Miss Genevieve Schneider, who has also left the state.

Bexar County Society of Medical Technologists: (San Antonio)
President—Mrs. Jane Fryar
First Vice-President—Sr. M. Bridgetine Glass
Second Vice-President—Mrs. Eileen Sherman
Secretary—Mrs. Dorothy Temple, 430 Thelma Drive, San Antonio, Texas
Treasurer—Mr. L. L. Williamson

Dallas County Society of Medical Technologists (Dallas)
President—Miss Frances Jones
Vice-President—Mrs. Margaret De Moye
Secretary—Miss Faith Wayne, Dallas, Texas
Treasurer—Miss Lucille Timms

Tarrant County Society of Medical Technologists: (Fort Worth)
President—Miss Barbara Bickle
Vice-President—Miss Fannie Jackson
Secretary-Treasurer and Corresponding Secretary—Miss Dorothy Patras, Harris Memorial Methodist Hospital, Fort Worth, Texas

Travis County Society of Medical Technologists: (Austin)
President—Miss Frances Kelly
Vice-President—Miss Betty McGrew
Secretary-Treasurer—Mrs. Rita Reuter, Austin, Texas
Parliamentarian—Miss Doris White

MICHIGAN SOCIETY OF MEDICAL TECHNOLOGISTS

President—Miss Edna Luneke, Grand Rapids
Vice-President—Miss Harriette Sadowski, Detroit
Recording Secretary—Miss Gladys Jacobs, Bay City
Corresponding Secretary—Miss Aino Osterberg, 9556 Burnette, Detroit 4
Treasurer—Miss Helen Psik, Jackson
Miss Marjorie Kenyon, Kalamazoo
Miss Rachel Mason, Detroit
S. E. Gould, M.D., Detroit
L. A. Ferguson, M.D., Grand Rapids
E. W. Meredith, M.D., Port Huron

MINNESOTA

The following quotational excerpts from a letter written by Miss Frieda Claussen to a District President carries enlightening features about good state organization:

"N.—— writes me that you are the incoming president of the District No. 3 Society of Medical Technologists, so I am writing to you about the membership program for the year in your district . . . I have decided to divide the membership work among the various local societies, and see if we can get enough cooperation in this manner to get a bigger and better state and national membership than ever before, preferably, or wherever possible by more personal contacts. For this purpose I would suggest that you appoint a membership chairman and have her get up a committee (or work alone if she prefers it so) to carry on the job in your district, which I have been doing entirely alone to date.

"The work consists of two main parts. First of all, to contact all the active M.T.s in your locality who are not already state and national members and to urge them to join. Second, to work along with the Treasurer of your local society in going after delinquent dues. I have tried wherever possible to follow up delinquencies with 2nd, 3rd and even 4th notices, and to obtain formal resignations from those who wish to drop out. Changes of name and address also form part of the job, because I have to notify the Editor and other officers, in order to keep their membership lists up-to-date.

"I have already sent one letter out this summer, to all the new names on the '46 list which I obtained from the Registry in May. I have called this my 1946 Survey letter, and am enclosing a

copy, so that you may see what has been done so far this year. I am sending the lists I have prepared to you, so that you may turn them over to whomever you may appoint, and she and I can work together and save quite a bit of time. Please notify me as to the name and address of your new Membership Chairman. Naturally you will want her to work for membership in your own district society also, and since all three societies have the same membership requirements, this should work out very nicely.

"The lists enclosed may not mean anything from the angle of name and address but may help other committee chairmen in organization of membership committee work. For that reason the liberty to quote headings of list is being taken:

"District No. 3. Attention: Chairman of Membership Committee.

"Lists of Minnesota Registered (ASCB) Medical Technologists in your district not yet members of the Minnesota Society:

"List No. 1. Those who have been contacted several times in the past, and have replied that although they are active in the field of medical technology they are not interested in joining the state or national societies. Please see what you can do to stimulate their interest.

"List No. 2. Those who have been contacted at least once, but have never replied to communications. Please keep after them until you get some sort of an answer from them.

"List No. 3. Minnesota members not yet members of the national society. These should be contacted for national membership only. More names may be obtained from ASMT Executive office.

"List No. 4. These have joined the ASMT but not the Minnesota Society."

Note: Miss Frieda Claussen has been chairman of the Membership Committee of the Minnesota Society of Medical Technologists for a number of years. The fruit of her good work is evident from the fact that 206 out of 214 M.T.s in the state of Minnesota belong to MSMT.

Submitting: Sr. M. Alcuin, OSB

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TO ATTEND THE

A. S. M. T.
ANNUAL CONVENTION

HOTEL SHIRLEY SAVOY

DENVER, COLORADO

June 30, July 1 and 2

1947

SEMINAR: JANUARY, 19, 20, 1947, at Ft. Worth, Texas

Texas Society of Medical Technologists

Oklahoma Society of Medical Technologists